eighty doses of neosalvarsan in addition to bismuth, potassium iodid, and mercury. No fatal nitrotoid reactions or ruptured aneurysm following arsenical injections were observed in the entire period. We have seen, likewise, cases progress to rapidly fatal terminations during persistent treatment. In spite of this I feel that the disease has often been held in check.

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C. W. BARNETT, M. D. (Stanford University Hospital, San Francisco).—Autopsy reports show evidence of aortitis in a large percentage of patients with supposedly latent syphilis, but only a few of these patients ever develop serious disability. The problem in simple aortitis is, therefore, not to make a diagnosis of a condition which is present in nearly every patient with syphilis, but to pick out from the whole group those in whom the process is likely to advance. The signs and symptoms mentioned by Doctor Newman are undoubtedly useful for this purpose. There is, however, a good deal of uncertainty as to the prognosis, and because of this the beneficial effects of treatment have not been proved.

When aortic regurgitation of aneurysm complicates the picture, the diagnosis is more certain and the prognosis is better known; but the effects of treatment are still doubtful. The results of treatment as shown by Grant are given in this paper. These figures are apparently more accurate than any others that have been published up to the present time. They suggest that specific therapy does improve the prognosis slightly in these more advanced stages of the disease.

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GEORGE V. KULCHAR, M. D. (450 Sutter Street, San Francisco).—At the present time the value of specific treatment in cardiovascular syphilis is debatable. The apparently satisfactory results cited by Moore and his coworkers as evidence of the value of specific treatment is open to the criticism of analysis by the retrospective method. That is to say, patients who lived the longest following the beginning of treatment naturally received the greatest amount of therapy and fell into the "satisfactory outcome group." On the other hand, the patients who died within a few weeks following the beginning of treatment were placed in the "unsatisfactory outcome group." This method of analysis gives rise to a considerable error. As pointed out by Barnett, the only method by which the effect of treatment can be definitely evaluated is by careful observation of a large number of patients until death, half the series receiving specific treatment, and the other half no specific treatment. Every alternate patient, regardless of the stage or severity of the disease, should be used as a control. It is only through a survey by this method, made over a period of years, that the actual value of specific treatment in cardiovascular syphilis can be determined. Regardless of the effect of treatment on the ultimate outcome in cardiovascular syphilis, the symptomatic relief obtained is often striking. I agree with Doctor Newman that treatment should not be started in the presence of frank cardiac decompensation; rather all efforts should be directed toward restoring compensation. Digitalis, except when auricular fibrillation is present, is of little value. Preliminary preparation with mercury succinimid in one-sixth grain doses, given intramuscularly three times a week along with potassium iodid by mouth, is most important in the treatment of cardiovascular syphilis. After four to six weeks of such preparatory treatment, the arsphenamins may be used, as suggested by Doctor Newman. Except in early aortitis, neoarsphenamin is preferred to aresphenamin. Another drug which has a definite place in the treatment of aortic insufficiency and aneurysm is bismarsen (bismuth arsphenamin sulphonate). Many syphilologists, including Stokes, maintain that it is the drug of choice. The low toxicity, the therapeutic efficiency, and marked tonic effects make bismarsen particularly adaptable to the treatment of cardiovascular syphilis. It is well tolerated, even by the most dehabilitated cardiac. It should be given in an unbroken series of from forty to eighty intramuscular injections at five- to seven-day intervals. Bismarsen deserves wider popularization in the treatment of cardiovascular syphilis.

BILATERAL DISLOCATIONS OF THE CERVICAL SPINE*

By RALPH SOTO-HALL, M.D.
AND
KEENE O. HALDEMAN, M.D.
San Francisco

DISCUSSION *by Don King, M.D., San Francisco; Rodney F. Atsatt, M.D., San Francisco; Howard W. Fleming, M.D., San Francisco.*

IT is our purpose to review the subject of bilateral or complete dislocations of the cervical spine, leaving aside any discussion of the so-called unilateral cases. Many of the large series of cases of cervical injury reported in the literature are composed chiefly of unilateral dislocations, in which treatment is simpler and the results much better. The reduction and postoperative care of these unilateral cases is a problem of an entirely different nature. In the bilateral dislocations serious injury to nerves, vertebrae and intervertebral discs, and recurrences and residual mechanical arthritis, are common.

In order to obtain a true cross-section and clear understanding of these problems, we have reviewed a series consisting of forty cases from our private practice and from clinics served by us, and have included eight cases from the files of the Industrial Accident Commission. The latter are particularly valuable in that they show end-results with the percentage of permanent disability and the corresponding monetary loss.

REVIEW

One of the early advances in the reduction of these injuries was the method of manipulation devised by Walton.[1] This is chiefly applicable to the unilateral dislocations, and is carried out by bending the head backward and to the side away from the lesion, thus increasing the deformity. The next maneuver consists of a rotation of the head toward the side of the lesion, which permits the dislocated facet to drop into place.

In the bilateral, forward, dislocations, the foregoing method has been largely replaced by that of Taylor [2] in which reduction is accomplished by traction, hyperextension and gentle manipulation, followed by immobilization of the neck in plaster. This treatment will be described later in detail. Fleming [6] has made use of lumbar puncture and manometric estimations, in association with the Taylor manipulation of cervical dislocations to determine the disappearance of subarachnoid block. Such a disappearance of block was thought to indicate a reduction of the dislocation. The symptoms of severe injury to the spinal cord, often associated with cervical dislocation, have inclined some surgeons to advocate *early* laminectomies in the hope of relieving pressure on the cord. This treatment received experimental support in the work of Allen,[3] who did laminectomies

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Read before the General Surgery Section of the California Medical Association at the sixty-fourth annual session, Yosemite National Park, May 13 to 16, 1935.

TABLE 1.—*Sex Incidence*

	No. of Cases	Percentage
Male	33	82½
Female	7	17½

in dogs following the production of injuries to the cord, and observed better recoveries in the dogs in which the dura had been opened, as compared with nonoperated controls. Coleman [4] used the Queckenstedt test for subarachnoid block (spinal puncture and jugular compression) to determine the advisability of early laminectomy. The disastrous experiences of Taylor and other surgeons who opened the dura following cervical dislocations, has caused a trend toward conservative treatment. Towne,[5] in a recent review, concluded that "laminectomy can do no good in cases of injury of the spinal cord resulting from dislocation of the spine, and may do harm."

In the past five years several large series of cases of cervical dislocation have been reported. Langworthy [7] cited thirty personal cases, of which seventeen were bilateral dislocations. Of the latter patients, five died and one of the surviving patients had a recurrence of the dislocation. A comprehensive analysis of forty-eight patients having various types of injury of the cervical spine was presented by Mackh [8] from the Harbor Hospital in Hamburg. He found the mortality rate to be 5 per cent in patients with partial dislocation, and 30 per cent in those with total dislocations. Brookes,[9] in 1933, reported forty cases of cervical dislocation, of which number, eleven were bilateral dislocations. Complete reduction was obtained in twenty-eight, partial reduction in eight, and failure resulted in one case. No attempt was made to reduce the dislocation in three patients. Redislocation occurred in four patients (10 per cent). The same author [10] brought his series of traumatic dislocations of the neck up to sixty-five in 1935.

From an inspection of the illustrations in the papers mentioned in the preceding paragraphs, it is apparent that many cases which were considered reduced actually showed the persistence of a slight forward displacement of the vertebra. This incompleteness of reduction predisposes to a recurrence of the dislocation, or at least leads to persistent symptoms of damage to the nerve roots, and arthritic changes. We must raise our standards of satisfactory reduction, and must insist upon a perfect realignment of the anterior borders of the vertebrae.

TABLE 2.—*Age Incidence*

	No. of Cases	Percentage
0- 9 years	4	10
10-19 years	4	10
20-29 years	4	10
30-39 years	12	30
40-49 years	9	22½
50-59 years	6	15
60-69 years	1	2½

TABLE 3.—*Causative Mechanism*

	No. of Cases	Percentage
Automobile accident	15	37½
Fall on head or neck	11	27½
Dive into shallow water	4	10
Fall while intoxicated	4	10
Blow on head or neck	3	7½
While under anesthetic	1	2½
Manipulation by cultist	1	2½
Sudden movement of head	1	2½

ANALYSIS OF FORTY CASES OF BILATERAL DISLOCATION OF CERVICAL SPINE

In this series of forty cases males constituted 82 per cent of the patients (Table 1), an incidence which is characteristic of injuries occurring largely in industry and sports. The decades from thirty to forty, and from forty to fifty, contained the largest number of cases, the average age being thirty-five years (Table 2).

While a large variety of causes of dislocation were found, automobile accidents were in preponderance (Table 3). Diving into shallow water accounted for four such injuries, and falls for most of the remainder. The most vulnerable vertebra (Table 4) appeared to be the fifth cervical, followed in order by the sixth, fourth, and first cervical vertebrae. The latter localization occurred in the younger patients (average age twenty-five years). Fractures of the vertebral body or some portion of the neural arch were associated with the dislocation in one-half of the series. This incidence is probably larger because minor fractures are often overlooked.

The symptoms and signs associated with dislocations of the neck may be grouped as local signs (torticollis, limitation of motion, pain in

TABLE 4.—*Level of Dislocation and Associated Fractures*

	No. of Cases	Percentage
C I	5	12½
C II	3	7½
C III	3	7½
C IV	6	15
C V	13	32½
C VI	9	22½
C VII	1	2½
Associated fracture of vertebral body or neural arch	20	50

TABLE 5.—*Permanent Disability Following Dislocation of Cervical Spine*
(From Files of California Industrial Accident Commission 1926-1934)

Age	Nature of Injury	Treatment	Permanent Rating		
			Per Cent Disability	Weeks	Cost
38	Compression fracture C V with slight displacement	Bed rest for twenty-five days	43¼	161	$3,350
38	Dislocation C VI Fracture C VII	Not diagnosed and not treated	55	220	$4,582
48	Dislocation C II	Traction two weeks, collar one year	32¾	131	$2,728
43	Dislocation C IV Compression fracture C V	Undiagnosed for four months. No treatment	.....	.....	$2,400
42	Dislocation C VI Compression fracture C V and VI	Manipulation followed by cast for three months	.....	.....	$5,050
53	Dislocation C V	No manipulation, cast ten weeks	59½	238	$3,175
32	Dislocation C VI	Manipulation, cast one month	59	235	$4,559
34	Dislocation C IV Fracture C V	Head traction one week followed by physiotherapy	58¾	.....	$5,078
		Average	51%		$3,865

the neck), symptoms of injury to nerve roots (paresthesias and anesthesias over shoulders and arms), and those of injury to the spinal cord. Symptoms of the latter were noted in twenty-five patients, consisting, in the order listed, of paralysis of the arms, anesthesia and paralysis of the legs.

No specific treatment was characteristic of this series. Usually a manipulative reduction was carried out, followed by the application of a cast including the body and neck. Open reduction or laminectomy was performed on seven patients for correction of deformity or relief of pressure on the spinal cord.

In such a study as this, the results are difficult to interpret, owing to the incomplete follow-up notes in some of the clinic cases. The private cases showed, in most instances, a complete recovery within from six to eight months after the injury. Results in clinic cases were often less gratifying because recurrence was more common and there was a less rigid supervision of their after-care. As a rule, there was gradual disappearance of symptoms of injury to the spinal cord, although some weakness, anesthesia or paresthesia often persisted indefinitely. Pain arising in the nerve roots was particularly annoying in certain patients who had not received early and adequate treatment.

A recurrence of the dislocation following reduction was noted in four patients. Death within a few days of the accident occurred in seven instances. Of special interest is the expression of end-results as observed in the record of eight patients with cervical dislocation who received permanent disability ratings by the Industrial Accident Commission of California in the years 1926-1934 (Table 5). The average permanent disability rating was 51 per cent, with an average cash payment of $3,865. These figures emphasize the tremendous physical and financial loss which results from such injuries, many of which did not receive an early diagnosis and few of which were given adequate treatment. Indeed, the medical records in almost all of these eight cases indicated an incomplete reduction or a recurrence of the dislocation.

TREATMENT

It need hardly be emphasized that the foremost consideration in the care of patients with fracture-dislocation of the cervical spine is the immediate reduction of the dislocation. With proper care in handling, such a reduction can be carried out without anesthesia and without jeopardizing the life of the patient. Early diagnosis and prompt treatment will greatly lessen the duration and extent of disability, since the edema and compression of the spinal cord caused by the displacement of the vertebra are the chief complications of such injuries.

We believe that the Taylor method of manipulation, followed by the type of immobilization to be described, offers the most satisfactory solution of this problem. The patient is placed on his back on any type of rigid table, and a head sling of muslin is so arranged that one loop rests upon the patient's chin and the other loop beneath his occiput. The ends of the sling are passed around the waist of the surgeon and tied. This permits the latter to maintain constant traction on the head by resting his weight against the sling, and at the same time leaves both his hands free to carry out gentle manipulation of the patient's neck (Figure 1). A steady downward pull on each of the patient's arms, by assistants, provides the necessary countertraction. Traction on the head is maintained for at least fifteen minutes to permit relaxation of the cervical muscles. The dislocated facets can often be felt to slip into place, and the patient may note immediate relief. The manipulation consists of a gradual increase in extension of the neck combined (in patients having torticollis) with Walton's maneuver of lateral flexion to increase the deformity, followed by rotation away from the deformity. When a satisfactory reduction seems to have been accomplished, this

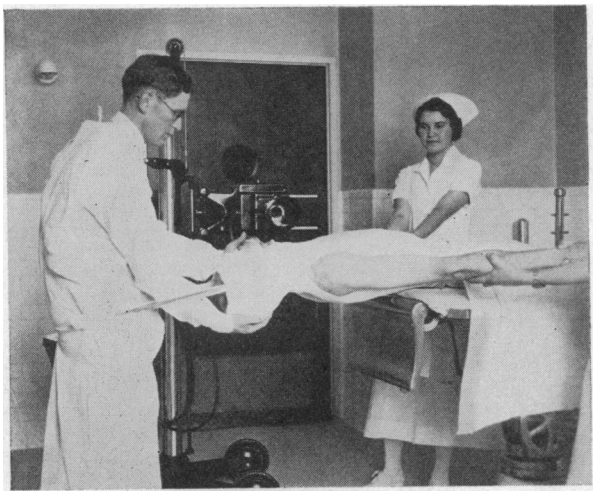

Fig. 1.—Taylor method of reduction of cervical dislocation. Note the portable x-ray unit.

position should be checked by a fluoroscopic examination or a film taken with a portable x-ray unit. After reduction has been proved, a cast is applied which includes the chin and occiput, and extends down to the iliac crests, with the neck in complete hyperextension. Because of the high incidence of recurrence, even with a cast such as this, we have recently incorporated two small turnbuckles in the cast, extending from the region of the middle of each clavicle to the side of the chin. The oblique position of the two turnbuckles prevents lateral motion of that portion of the cast which supports the chin (Figure 2). If subsequent x-ray films, which are taken at intervals of two or three days, show any slipping forward of the injured vertebra, the cast is cut in a transverse direction anteriorly to include two-thirds of the circumference of the neck, and increased extension of the neck is obtained by means of the turnbuckles. Thus recurrent dislocation is reduced or prevented."

The first cast is worn for from eight to twelve weeks and is followed by a Thomas collar for about four weeks longer, the length of immobilization depending upon the severity of injury and upon the evidence of repair given by the x-ray. After two or three months the latter often shows a solid bridge of bone extending from the anterior border of one vertebra to another at the site of dislocation.

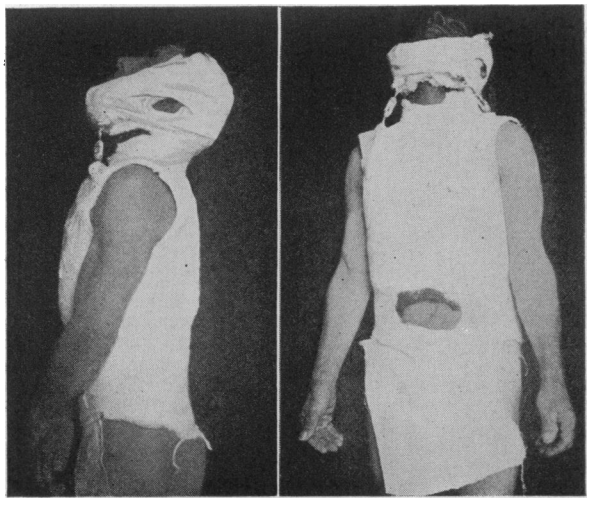

Fig. 2.—Lateral and anterior views of cast, with turnbuckles to provide adaptable hyperextension of the neck.

REPORT OF CASES

A few cases treated by various methods have been selected for special study because they illustrate the problems presented by these injuries and point the way to a rational method of treatment.

Case 1.—J. M., male, fifty years of age, had his chin caught beneath the wheel of an overturned automobile. There was immediate and complete paralysis and anesthesia from the shoulders down. Lumbar puncture showed a blood-tinged spinal fluid and an incomplete block. An attempt was made to reduce the complete dislocation of the sixth cervical vertebra, with partial success, but with no improvement of neurologic signs. The patient expired three days after the injury. It is evident that the spinal cord was completely severed by the injury, and that any treatment was hopeless.

Case 2.—J. D., male, fifty years of age, was thrown on his neck when an automobile overturned. He had immediate pain in the back of the neck, and numbness and tingling of both arms, indicating pressure on the nerve roots. An x-ray examination showed a dislocation of the fifth cervical vertebra and a fracture through the laminae of the neural arch. The dislocation of the fifth cervical vertebra was reduced by traction on the head under the fluoroscope, with immediate relief of pain in the arms, and a cast was applied. A few days later the pain in the arms recurred, and a lateral radiogram showed that the fifth cervical vertebra had again slipped forward. Later attempts to reduce this recurrence were only partially successful.

This case demonstrates the necessity for immobilization of the neck in complete hyperextension, which had not been done. The associated fracture of the neural arch also favored a recurrence of the dislocation.

Case 3.—F. R., male, thirty-five years of age, injured his neck in an automobile accident. He complained only of pain in the neck, and a neurologic examination was negative. Two days later the x-ray revealed a dislocation of the fourth cervical vertebra. This was reduced by traction on the head for twenty minutes, followed by the application of a cast. Two weeks later another radiogram revealed the recurrence of the dislocation. An open reduction was carried out, and the fourth cervical spinous process was wired to that of the sixth cervical in the hope of preventing another recurrence. Films taken two months later showed a definite increase in the displacement of the fourth cervical vertebra.

This case also illustrates the need for hyperextension after reduction and shows the futility of an attempt to prevent displacement of an imperfectly reduced vertebra by means of internal fixation.

Case 4.—E. A., male, seventeen years of age, dived into shallow water. He had a complete quadriplegia which cleared up following manipulation under anesthesia. The reduction was followed by a cast to the chest and neck for seven weeks, after which a very ineffective metal collar was worn. The weakness of all four extremities gradually increased, and at the time of examination by Dr. Howard Fleming and one of the authors, fourteen weeks after the injury, there was almost complete quadriplegia. Radiograms showed a severe compression fracture of the fourth cervical

vertebra, with dislocation of the third cervical vertebra, producing a sharp backward angulation of the spine at that level. A laminectomy was performed, and the spinal cord, which was compressed against the body of the fourth cervical vertebra, began to pulsate when the laminae were removed. After the laminae had been removed, it was impossible to obtain any correction of the deformity, even with strong traction on calipers fixed in the mastoid region. The patient began to improve immediately after the operation, and showed a progressive return of strength to all extremities over a period of two years.

Recurrence because of inadequate immobilization is again shown, and the value of *late* laminectomy to relieve pressure on the spinal cord is demonstrated.

* * *

CASE 5.—H. de M., female, thirty-five years of age, was injured in an automobile accident. She presented a flaccid paralysis and anesthesia of the right arm. A dislocation of the fourth cervical vertebra was completely reduced by steady traction for twenty minutes, followed by hyperextension of the neck. The hyperextended position was maintained by a cast extending from the iliac crests to the head. Immediately after reduction, power returned to the right arm, and the sensory disturbance gradually disappeared. The patient made a complete recovery.

* * *

CASE 6.—B. F., thirty-seven years of age, was injured in an automobile accident. In addition to an injury to the neck, she sustained a dislocation of the hip which was reduced at once. No radiograms of the neck were made until six weeks after the accident, when they showed a dislocation of the fifth cervical vertebra. She presented a marked limitation of the movement of the neck and pain over the distribution of the cervical nerves. Reduction of the dislocation was accomplished by gradual hyperextension of the neck as the patient lay on a Bradford frame, and traction for twenty-four hours was maintained with a head halter. The neck was then immobilized in a long cast, in which a turnbuckle was incorporated to permit a gradual increase in the degree of hyperextension, in the manner previously described. The patient made a complete recovery within three months of the institution of treatment.

* * *

CASE 7.—R. T., male, three and one-half years of age, fell out of a tree. His mother observed a marked torticollis and forward inclination of the neck, but was sure no serious injury had occurred because the boy's appetite was unimpaired. One week later, however, an x-ray examination showed a dislocation of the second cervical vertebra. The neck was quite rigidly held in forward flexion, but a neurologic examination was negative. The Taylor type of manipulation under anesthesia gave a complete reduction of the dislocation. Immobilization of the neck in hyperextension was maintained with a long cast to which two turnbuckles were attached. No signs of injury were present four months later.

* * *

CASE 8.—S. S., male, forty-five years of age, was thrown from a mowing machine. He experienced pain in the neck and right arm, and weakness of both arms. These symptoms persisted without treatment until our examination four weeks later, which showed a dislocation of the fifth cervical vertebra and a fracture of its spinous process. Treatment at the time consisted of continuous traction for one day followed by manipulation of the neck without anesthesia. The dislocation was reduced, after which a cast was applied from the iliac crests to the head. A few days later the x-ray showed a partial recurrence of the dislocation, which was corrected by cutting the cast anteriorly at the level of the fracture, attaching two turnbuckles to the cast from shoulder to chin and gradually increasing the extension of the neck until full hyperextension was attained. This immobilization was continued for three months, after which a metal collar was worn for one month. A radiogram then showed a firm bridge of bone connecting the anterior surfaces of the fifth and sixth cervical vertebrae. Six months after the beginning of treatment, the neck had a normal range of motion, although the patient still complained of occasional slight pain in the neck, which was probably the result of arthritic changes.

CONCLUSIONS

1. Dislocations of the cervical spine, with or without associated fractures, demand immediate reduction and prolonged immobilization of the neck in hyperextension.

2. Failure of early diagnosis and adequate treatment results in permanent disability, because of arthritic changes in the spine and compression of the nerve roots or spinal cord.

3. A method of postmanipulative immobilization is described, which consists of the attachment of small turnbuckles to a long plaster jacket and collar in such a way as to permit a gradual increase in the hyperextension of the neck.

4. A series of forty cases of bilateral dislocation of the cervical spine is analyzed with regard to incidence, localization, causation, treatment, and final results.

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DISCUSSION

DON KING, M.D. (Stanford University School of Medicine, San Francisco).—In cervical spine dislocations, accurate anatomic reduction and prolonged retention are essential for proper function, comfort, and stability. Since Taylor first described his manipulative technique, there has been a gradual acceptance of the fact that reduction can be safely and efficiently accomplished by manipulation. The discomforts and difficulties of traction in the overcorrected position have led to a more general use of the plaster cast to maintain reduction and hasten ambulation. As the authors have pointed out, recurrence of the dislocation, in spite of the plaster cast, is prone to take place. Anyone who has had the disconcerting experience

of a recurrence will welcome the authors' suggestion of using turnbuckles in the cast to maintain and increase the hyperextended position of the cervical spine.

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RODNEY F. ATSATT, M. D. (1421 State Street, Santa Barbara).—Doctors Soto-Hall and Haldeman are to be commended for bringing up this timely subject. It is often a serious question deciding what to do at the critical time in order to conserve bone structures, nerve structures, or life itself. The clear review of methods of handling these difficult injuries is very valuable.

May I emphasize several points which have already been made but which, to my mind, are important in treatment?

The first is early and accurate diagnosis; this is often hard to achieve because of the difficulties of x-ray technique, especially in the lower cervical region.

The second point is gentleness in manipulation. If the laminae are intact the dislocation must be reduced, but certainly not by "unskilled labor," as life often hangs by a precarious thread during these moments.

The third point is the authors' very ingenious device for maintaining hyperextension, by use of turnbuckles; an old principle, with a new application. This should give excellent results.

In listening to their paper, however, I miss the mention of traction in the treatment of certain types of fracture dislocations. Traction in hyperextension with the old Sayre sling halter or one of the newer modifications is a method which must never be forgotten.

There is another thing which I would like to bring to your attention: occasionally we see a case where ultra-conservatism seems to be indicated. As an example of this type of injury, I would like to present one case.

Male, aet. 55, CWA employee. While working on a steep bank, a root upon which he was pulling gave way, allowing him to roll and fall about 25 feet. He sustained a forward dislocation of the second cervical vertebra on the third, a transverse fracture of both laminae in the mid-portion, and a chip fracture of the anterior edge of the body of the third. There was only local pain—absolutely no cord symptoms. Manipulation might have been productive of a reduction, depending upon whether or not the anterior ligaments were intact. However, I felt that while the persistence of the dislocation of the body would give some residual stiffness, the natural laminectomy which had been performed had better be left alone, and this was done. Head traction, eight weeks' metal collar and adequate intensive physical therapy for four weeks, back to light work in three months, and full work as laborer in four and one-half months with very little loss of mobility in the neck.

This case also brings up the question of physical therapy. It seems to me there is no step in the care of these cases of more importance than that given by an adequately trained physical therapist, one who knows and understands muscle reëducation. I am sure that the authors will agree that such rehabilitation is of utmost importance in cases involving joints, muscles, and ligaments.

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HOWARD W. FLEMING, M. D. (384 Post Street, San Francisco).—The paper by Doctors Soto-Hall and Haldeman gives emphasis as to the necessity of early reduction and proper support in cases of cervical spine dislocation.

The complication in such cases that gives most concern is the damage to, or continued pressure on the spinal cord. We have found it advantageous to combine the Queckenstedt test with the Taylor manipulation. Our primary object is not to use the test to determine anatomical reduction of the dislocation, as is suggested in the text of this paper under discussion. Frequently, it is possible to predict satisfactory reduction by what one hears and feels in the patient's neck, and also by the reappearance of normal reactions to jugular compression. However, satisfactory anteroposterior and lateral x-rays are necessary to confirm a proper reduction.

We have found that certain positions will cause or relieve pressure on the cervical cord, sufficient to obstruct or open the cervical canal. We feel that manipulation can be done with greater safety if one has some gauge as to what pressure, if any, is being excited on the cervical cord. The number of cases when manipulation caused a sudden onset of paraplegia or death are probably far greater than the literature would suggest.

If one finds a complete block that cannot be relieved by gentle changes in the position of the head and neck, one must conclude that pressure on the cord is great or that edema of the cord is extreme. To continue strenuous manipulation in such cases is to invite further injury of the cord. We feel it far safer to maintain traction, with calipers placed in the skull, and do an open reduction and decompression.

The recurrence of dislocation is fairly common, and the author's use of turnbuckles incorporated by a cast is very ingenious. Our experience has been that the patient can seldom tolerate the pressure of a halter on the chin and back of the head. Skeletal traction causes little discomfort, and effective halter traction can be secured in a proper direction to maintain reduction.

PYODERMATOSES*

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AND
SAMUEL AYRES, JR., M.D.
Los Angeles

DISCUSSION *by Ernest Dwight Chipman, M. D., San Francisco; Franklin I. Ball, M. D., Los Angeles; Sophie A. Lurie, M. D., Los Angeles.*

THE purpose of this paper is to discuss some of the pyogenic infections of the skin. These form a distinct group from an etiologic standpoint, being produced by organisms which have the skin as their normal habitat. The diagnosis of these conditions in most cases offers no particular difficulty. In some of them, such as impetigo, therapy offers no great problem, while in others, such as sycosis, even persistent treatment carried out over a period of years may fail to effect a cure. It is our desire, in presenting this subject, to stimulate discussion of the pyodermas and especially those characterized by their refractoriness to present-day therapy.

IMPETIGO CONTAGIOSA

The common types of impetigo contagiosa require no discussion in a paper of this type. Mention should be made of the annular or circinate type, which is so often mistaken by the general practitioner for a ringworm infection. The generalized bullous type of impetigo is infrequent, and even when it does occur we are perhaps too prone to consider the condition a pemphigus.

It is the secondary or consecutive types of impetigo which are sometimes very misleading. Thus we see an impetigo of the nape of the neck secondary to pediculosis capitis; an impetigo of the hands, or one that is fairly well generalized, is often seen as a complication of scabies. Such a secondary pyodermia may be so severe as to mask entirely the essential underlying condition. Many cases of dermatitis venenata, eczema, epidermophytosis, herpes simplex, and insect bites may present a secondary impetigo.

Impetigo of the new-born occurs more frequently in the lying-in wards of our hospitals than

* Read before the Dermatology and Syphilology Section of the California Medical Association at the sixty-fourth annual session, Yosemite National Park, May 13-16, 1935.